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ETHICS IN CARDIOTHORACIC SURGERY

Should Lung Cancer Screening Be Suspended During a Pandemic?



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The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2)—the causative agent for novel coronavirus disease 2019 (COVID-19)—is responsible for the ongoing pandemic of 2019 to 2021. A recurrent problem in health care is how best to allocate severely limited resources, and this pandemic has manifested the allocation problem on several levels, especially when demand has exceeded supply of critical needs such as medical and nursing personnel, personal protective equipment, intensive care beds, and ventilators. Medical centers have devised strategies to divert personnel and equipment from routine procedures and programs to the care of critically ill patients with COVID-19. For example, nonemergency surgery has been canceled to accommodate the influx of infected, severely ill patients. At the same time, the patients whose operations were canceled have been protected from exposure to the viral infection in hospital environments.

Preventive health care services, such as screening for lung cancer, present a special problem. Suspending screening may result in delayed a diagnosis of cancer, which may then lead to higher mortality for those patients whose cancers reach an advanced stage as a result of the delay. Yet overall benefit may result from freeing screening personnel to help with pandemic-related activities, at the same time protecting most screening candidates—those whose screening results will be negative—from exposure to an environment that may present a risk of viral infection. In this report we discuss ethical considerations in deciding whether to suspend lung cancer screening temporarily during a pandemic. This was the subject of the Cardiothoracic Ethics Forum session at the Fifty-seventh Annual Meeting of The Society of Thoracic Surgeons (STS) in January 2021.

LUNG CANCER SCREENING AND DELAYS IN TREATMENT

The current basis for lung cancer screening was established in the National Lung Screening Trial, which enrolled patients aged 55 to 74 years who had used

tobacco for a least 30 pack-years and who had continued tobacco use or had quit within the previous 15 years.¹ The study demonstrated that early diagnosis by low-dose computed tomography decreased lung cancer mortality by 20%. The European Nelson trial randomized patients aged 50 to 74 years who had used tobacco for >25 years and who were current smokers or had quit within the previous 10 years. This study demonstrated an even more profound benefit: lung cancer mortality decreased by 26% to 39%.² The results of these trials allow an estimate that if lung cancer screening were fully implemented in the United States, approximately 250 lives could be saved every week.³

When cancer is detected, some studies suggest higher stage and worse survival in patients whose care is delayed. Khorana and colleagues⁴ showed an increase in cancer deaths for each week of delayed time to the initiation of cancer treatment, and these investigators also found that delays in therapy of 6 weeks or more resulted in a 13% absolute increase in 5-year lung cancer mortality. Adverse outcomes were further magnified when restricted to patients with early-stage cancer who were undergoing surgical therapy.

Conversely, screen-detected lung cancer exhibits, on average, less aggressive behavior.^{5,6} An important consideration from the Nelson trial is that the stage distribution was not different between annual and biennial screening.² Meta-analysis of randomized controlled trials found an unaltered reduction in lung cancer mortality with biennial vs annual screening.^{2,7-9} Data from screening randomized controlled trials suggest that a delay of up to a year may not have the same impact as that suggested by nonrandomized database studies of lung cancers detected by usual care.

It is worth noting that the nonrandomized database studies all have residual confounding because of an inability to adjust for factors that are likely to cause a delay in treatment and independently be associated with worse long-term survival (eg, comorbidities, factors complicating treatment, access to care).⁴⁻¹⁰

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ETHICAL CONSIDERATIONS

A commonly used method of evaluating ethical issues is the 4-principle approach of Beauchamp and Childress: autonomy (respect for persons), nonmaleficence, beneficence, and justice.¹⁰ A hospital's decision to suspend its lung cancer screening program preempts patients' ability to make their own decisions on the basis of the benefits and risks of a proposed procedure as explained by their physicians. It also overrides physicians' ability to apply their understanding of the facts surrounding screening to the circumstances of a particular patient. Peremptory closure of a screening program thus denies both the patient and the physician the possibility of engaging in shared decision making, a process intended to result in the best decision in the context of the medical facts and the patient's values.¹¹ An institutionally directed policy to suspend screening therefore fails to respect both patient and physician as persons and thus violates the principle of autonomy.

In balancing harms and benefits of any procedure, harms to patients that exceed benefits should be avoided, according to the principle of nonmaleficence. If evidence indicates that patients undergoing lung cancer screening would be exposed to substantial risk, the focus would be on protecting the patient. At the time of the 2021 STS meeting, the United States had more COVID-19 deaths than the next 9 highest countries combined. In an average year, approximately 50 000 people die in the United States each week. From late January through October 2021, the weekly number of excess US deaths was more than 9000 (ie, approximately 6000 more deaths resulting from COVID-19 and 3000 more likely the result of lack of usual care).¹² Although lung cancer screening can potentially save the lives of approximately 250 people a week, this number pales in comparison with the excess 9000 deaths resulting from the pandemic. If it were true that viral exposure is a very substantial risk in our hospitals and health care systems, then this would be a legitimate reason for suspending lung cancer screening.

The well-intended rationale of protecting patients from exposure to the viral pandemic by keeping them clear of the health care system, however, is not borne out by the data. During the spring 2020 COVID-19 surge, an analysis of nosocomial viral transmission within the hospital setting found that in more than 9000 patients admitted to Brigham and Women's Hospital (in Boston, MA) during March to May 2020, nearly 700 patients had a diagnosis of infection with the virus, but only 2 of these were identified as having hospital-acquired cases.¹³ One case was identified as transmission from the patient's spouse rather than from the hospital, and the other case occurred in a patient with symptoms that developed shortly after hospitalization but without any

known exposure within the hospital. These investigators concluded that hospital transmission is extraordinarily rare, and that no avoidance or delay of hospital care can be justified by concern about viral transmission. Lung cancer screening clearly lowers lung cancer mortality, and withholding screening may result in a higher risk of later-stage disease and a consequent higher risk of lung cancer mortality.¹⁻⁴ Public health officials emphasized that there should be no avoidance or delay of health care during a viral pandemic from a public health perspective of avoiding viral transmission.¹⁴

When caring for patients, physicians are obligated to act for the benefit of the patient, as indicated by the principle of beneficence. Lung cancer screening undoubtedly can benefit patients by lowering lung cancer mortality. As shown in the preceding paragraphs, a policy that substantially delays screening potentially risks later-stage disease, more complex treatment, and a higher risk of cancer mortality, thereby undermining the advantages of screening. At some points during a pandemic, hospitals may become overwhelmed with infected patients to the point that most surgery other than emergencies is canceled or postponed, including lung cancer surgery. If treatment is perforce delayed, would it make sense to discontinue screening, or is there still a benefit to establishing a diagnosis of lung cancer? As we noted earlier, timely diagnosis continues to be important, even if treatment is temporarily delayed. First, diagnosis allows the identification of some patients with cancer who need urgent care requiring priority. Second, establishing a diagnosis allows the patient, surgical teams, and hospital system to be better prepared for resumption of cancer care when inpatient capacity returns. Third, this approach helps to avoid a progressive backlog of delayed diagnoses that have a cascading effect of delaying staging and treatment, thus leading to disastrous downstream consequences, including increased cancer mortality. Fourth, establishing a diagnosis allows better planning and triage of surgical urgency, by identifying patients whose treatment can be reasonably deferred, but proceeding with care in more urgent cases. Finally, lung cancer screening as a preventive strategy is at a fragile beginning stage of implementation; community acceptance is low, and barriers exist in education and support among primary care and other providers.¹⁵ Suspension of lung cancer screening runs the very real risk of undermining the momentum needed for developing effective screening programs.

The principle of justice in health care holds that patients who are similarly situated should be treated similarly and that burdens and benefits of care should be fairly distributed, including appropriate distribution of scarce resources. In the current pandemic, some hospitals have been overwhelmed with severely ill patients

with COVID-19 and consequently have been unable or barely able to care for infected and noninfected patients adequately.¹⁶⁻¹⁹ A pandemic surge may cause severe resource limitations and result in justifiable decisions to ration those resources in accordance with previously established criteria. During very severe resource limitation, suspension of screening could conceivably be justified. In reality, however, lung cancer screening does not meaningfully compete for the health care resources used for treating acute care infected patients or for other severely ill hospitalized patients who require care during a viral pandemic.

We can distinguish between the resources required for lung cancer *screening* and the resources required for lung cancer *treatment*. Screening generally requires an intake team, a computed tomography scanner, radiologists, and a pulmonologist or thoracic surgeon for interpretation of results and further decision making, all of which comprise an outpatient activity with negligible, if any, impact on inpatient resources. Temporary deferral of surgical treatment may be reasonable because surgical treatment requires an operating room team, a surgeon, an anesthesiologist, hospital beds, and possibly intensive care, all of which may compete for inpatient resources more acutely needed for critically ill patients. However, deferral of all treatment may be unnecessary because potential alternatives such as stereotactic ablative radiotherapy exist, not only as treatment, but also as a potential bridge to surgery, and they require resources similar to those of the lung cancer screening team.^{20,21}

Although resources generally should be allocated with the goal of reducing mortality for both individuals and society, a purely utilitarian approach is not ethically adequate for planning because special attention should be paid to maintaining a gateway to diagnosis and treatment for communities that historically have experienced reduced access to health care.²² The well-established, disproportionately high morbidity and mortality of minority communities during the SARS-CoV-2 pandemic highlight the difficulty but necessity of such special attention.²³ The same disparity exists in lung cancer screening and lung cancer treatment. Marginalized communities and individuals are disproportionately disadvantaged when barriers are erected to lung cancer screening and cancer care. A utilitarian approach of maximizing the number of patients receiving care cannot justify disregarding care for vulnerable individuals or communities, including marginalized populations at risk for lung cancer.

Although one can consider the ethics, risks, and benefits of an individual, or the impact of a particular intervention such as screening, the SARS-CoV-2 pandemic has made it clear that the aggregate of many individual behaviors constitutes overall societal behavior that has a large impact. At what point does

what is right from an individual's point of view become overshadowed by what is right from a societal point of view? When the spread of a pandemic is underway, broad measures to alter the course are needed; it is not the time to argue about the ethics for 1 individual or 1 intervention such as a screening computed tomographic scan in isolation. The underlying question is this: At what point does the societal point of view become dominant for the short term? The pandemic impact in New York in the spring of 2020, Los Angeles in early 2020, and Michigan later in 2020 seem to be such situations.

In conclusion, we have considered facts and arguments related to the SARS-CoV-2 pandemic and those surrounding screening for lung cancer and treatment of patients with a diagnosis of cancer. In light of those facts and arguments, perhaps the answer to the question whether screening should be halted is, it depends. When a pandemic strikes and exponentially increasing infections overwhelm a community and its hospital system, physicians and public health and political leaders are obligated to address the effects on society in general and to act decisively, collectively, and broadly. Such a situation clearly has many negative implications, such as hampering the delivery of needed nonpandemic health care. We have presented data that show a detriment associated with delaying treatment of lung cancer in general for several months; however, other data suggest that delaying detection of screen-detected lung cancer by several months may be less consequential.

Less acutely, the question of how to alter behavior in a manner that prevents escalation of the pandemic but allows activities such as general health care and screening to proceed is difficult to answer because it involves many aspects, such as the risk to individuals screened, the prevalence of severe pandemic-related illness, available resources, vaccination rates, and behavior of individuals in general. We have learned much about managing both patients and the public in response to the SARS-CoV-2 pandemic, and we have developed powerful resources, such as monoclonal antibodies and novel mRNA vaccine technology, to combat viral disease. The available evidence during the SARS-CoV-2 pandemic demonstrates that minimal risk of viral exposure accompanies lung cancer screening, and little overlap exists between resources used in lung cancer screening and those needed for acute care during this pandemic; therefore, general suspension of lung cancer screening seems unjustified. This conclusion is narrow because future viral pandemics may have characteristics different from this one. Data regarding pathophysiology and transmission of a future virus will need to be studied, and the resources needed for patient care must be carefully determined as the health care system provides both routine and pandemic-related care. As we

achieve the ability to avoid potentially overwhelming pandemic surges and implement processes that allow

health care to function even if life is not completely “normal,” lung cancer screening should continue.

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